

**U.S. FISH AND WILDLIFE SERVICE  
DIVISION OF ENDANGERED SPECIES**

(Adapted from the *Federal Register* for Wednesday, July 20, 1994)

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**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**RIN 1018-AB88**

**Endangered and Threatened Wildlife and Plants; Final Rule To List the Rio Grande Silvery Minnow as an Endangered Species**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

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**SUMMARY:** The U.S. Fish and Wildlife Service (Service) determines the Rio Grande silvery minnow (*Hybognathus amarus*) to be an endangered species under the Endangered Species Act of 1973 (Act), as amended. This fish occurs only in the middle Rio Grande from Cochiti Dam downstream to the headwaters of Elephant Butte Reservoir, New Mexico. Threats to the species include dewatering, channelization and regulation of river flow to provide water for irrigation; diminished water quality caused by municipal, industrial, and agricultural discharges; and competition or predation by introduced non-native fish species. Currently, the species occupies about five percent of its known historic range. This action will implement Federal protection provided by the Act for the Rio Grande silvery minnow. The Service further determines that finalization of proposed critical habitat will not occur at this time, as critical habitat is not now determinable because the required economic analysis has not been completed. Pursuant to section 4(b)(6)(C)(ii) of the Act, a final determination on critical habitat may be delayed up to 1 year beyond the normal deadline.

**EFFECTIVE DATE:** August 19, 1994.

**SUPPLEMENTARY INFORMATION:**

**Background**

The Rio Grande silvery minnow is one of seven species in the genus *Hybognathus* found in the United States (Pflieger 1980). The species was first described by Girard (1856) from specimens taken from the Rio Grande near Fort Brown, Cameron County, Texas. It is a stout silvery minnow with moderately small eyes and a small, slightly oblique mouth (Pflieger 1975). Adults may reach 90 mm (3.5 in) in total length (Sublette *et al.* 1990). Its dorsal fin is distinctly pointed with the front located slightly closer to the tip of the snout than to the base of the tail (Pflieger 1975). Life color is silver with emerald reflections. Its belly is silvery white, fins are plain, and barbels are absent (Pflieger 1975, Sublette *et al.* 1990).

This species was historically one of the most abundant and widespread fishes in the Rio Grande basin, occurring from Espanola, New Mexico, to the Gulf of Mexico (Bestgen and Platania 1991). It was also

found in the Pecos River, a major tributary of the Rio Grande, from Santa Rosa, New Mexico, downstream to its confluence with the Rio Grande in south Texas (Pflieger 1980). Collection data indicate the species presently occupies about five percent of its historic range (Platania 1993). It has been completely extirpated from the Pecos River and from the Rio Grande downstream of Elephant Butte Reservoir. Currently, it is found only in a 275 km (170 mi) reach of the middle Rio Grande, New Mexico, from Cochiti Dam, Sandoval County, to the headwaters of Elephant Butte Reservoir, Socorro County (Bestgen and Platania 1991). Throughout much of its historic range, decline of *H. amarus* may be attributed to modification of stream discharge patterns and channel desiccation by impoundments, water diversion for agriculture, and stream channelization (Bestgen and Platania 1991, Cook *et al.* 1992).

The Rio Grande silvery minnow no longer exists in the Pecos River where it was replaced by a congener, the introduced plains minnow (*H. placitus*) (Hatch *et al.* 1985, Bestgen *et al.* 1989, Cook *et al.* 1992). It is believed that the plains minnow was introduced into the Pecos drainage during 1968, probably the result of the release of "bait minnows" that were collected from the Arkansas River drainage. The replacement that ensued was complete in less than one decade (Cowley 1979). The plains minnow may be more tolerant of modified habitats and therefore able to replace *H. amarus* in the modified reaches of the Pecos River where it was introduced. It is also believed the two species hybridized (Cook *et al.* 1992). Habitat alteration and resulting flow modification could have also contributed to extirpation of the Rio Grande silvery minnow in the Pecos River.

Decline of the species in the Rio Grande probably began in 1916 when the gates at Elephant Butte Dam were closed. Elephant Butte was the first of five major mainstream dams constructed within the Rio Grande silvery minnow's habitat (Shupe and Williams 1988). These dams allowed the flow of the river to be manipulated and diverted for the benefit of agriculture. Often this manipulation resulted in the desiccation of some river reaches and elimination of all fish. Concurrent with construction of the mainstream dams was an increase in the abundance of non-native and exotic fish species, as these species were stocked into the reservoirs created by the dams (Sublette *et al.* 1990). Once established, these species often completely replaced the native fish fauna (Propst *et al.* 1987). Development of agriculture and the growth of cities within the historic range of *H. amarus* resulted in a decrease in the quality of water in the river that may have adversely affected the range and distribution of the species.

Most land bordering the river where the species currently exists is owned by the Middle Rio Grande Conservancy District, which is a quasi-public agency of the State of New Mexico. Other landowners include six Native American Pueblos, the U.S. Bureau of Reclamation, the Service, the U.S. Bureau of Land Management, New Mexico State Parks, New Mexico Department of Game and Fish, New Mexico State Lands Department, and the U.S. Army Corps of Engineers (Corps).

Water flow in the middle Rio Grande is controlled by the Rio Grande Compact Commission. Established in 1929 for the purpose of permanently and equitably apportioning the flows of the Rio Grande, the Commission is composed of a Federal chairperson appointed by the President of the United States and three voting members-a representative designated by the Texas Governor and the State Engineers of New Mexico and Colorado. The Commission meets annually to review compliance with the compact over the preceding year, to hear reports from Federal water management agencies, and to consider water management decisions that have interstate implications. Federal agencies that also determine timing and amount of flow in the river include the International Boundary and Water Commission, the Bureau of Reclamation, and the Corps.

## Previous Service Actions

The Rio Grande silvery minnow was listed on the Service's Animal Notice of Review (56 FR 58804; November 21, 1991) as a category 1 species. A category 1 species is one for which the Service has on file substantial information on biological vulnerability and threat(s) to support a proposal to list it as an endangered or threatened species. A proposed rule to list the Rio Grande silvery minnow as endangered with critical habitat was published in the *Federal Register* on March 1, 1993 (58 FR 11821).

## Summary of Comments and Recommendations

In the March 1, 1993, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. The comment period originally scheduled to close on April 30, 1993, was extended until August 25, 1993, (58 FR 19220; April 13, 1993) to conduct public hearings and allow submission of additional comments. Appropriate Tribal governments, State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices inviting public comment were published in New Mexico in the Albuquerque Journal on May 2, 1993; Las Cruces Sun News on April 30, 1993; Socorro Defensor Chieftain on April 28, 1993; Santa Fe New Mexican on April 20, 1993; and in Texas in the El Paso Times on March 20, 1993.

Because of anticipated widespread public interest, the Service held two public hearings that were announced in an April 13, 1993, *Federal Register* notice. Interested parties were contacted and notified of the hearings. Thirty-seven people attended the hearing in Albuquerque, New Mexico, and 58 attended the hearing in Socorro, New Mexico. Oral or written comments were received from 25 parties at the hearings; none directly supported the proposed listing. Transcripts of these hearings are available for inspection (see "Author"). Briefing sessions were also held for tribal leaders on May 18, 1993, in Albuquerque, New Mexico; and for a number of northern pueblos at Santo Domingo Pueblo, New Mexico, on September 9, 1993.

A total of 40 written comments were received at the Service's Ecological Services State Office in Albuquerque, New Mexico: 13 supported the proposed listing; 14 opposed the proposed listing; and 13 commented on information in the proposed rule but expressed neither support nor opposition.

Oral or written comments were received from 7 Federal and 5 state agencies, 14 local officials, and 36 private organizations, companies, and individuals. Written comments and oral statements presented at the public hearings and received during the comment periods are covered in the following summary. Comments of a similar nature or point are grouped into a number of general issues. These issues, and the Service's response to each, are discussed below.

**Issue 1:** The Service has come to the conclusion that only instream flow will assure the species' existence. Will the Service propose a program for the purchase of water rights in order to provide water for the species?

**Response:** The Service has not reached this conclusion. Possible instream flow requirements of the species are among several factors that need to be considered in the recovery planning process. If, during the recovery planning process, the Service determines that the purchase of water rights will enhance recovery of the species, the Service would explore with other State and Federal entities the possible purchase of water rights from willing sellers.

**Issue 2:** The United States, under the terms of the Convention of 1906, has the obligation to deliver 60,000 acre-feet of water annually to the Republic of Mexico. The U.S. International Boundary and Water Commission (IBWC) is responsible for ensuring that the U.S. government meets those obligations. The IBWC is concerned that the listing may interfere with their ability to meet these treaty requirements.

**Response:** The Service recognizes the treaty obligation of the United States to provide to the Republic of Mexico 60,000 acre-feet of water annually from the Rio Grande. Measures taken to protect and recover the Rio Grande silvery minnow will take into consideration this treaty obligation and IBWC's ability to meet treaty requirements.

**Issue 3:** Completion of the dams above Elephant Butte Dam has had the effect of extending stream flow. Flood control and conservation storage operations do not, cannot, and have not been used to create or extend reaches of no flow in the riverbed.

**Response:** The Service agrees with the statement. Availability of flow is likely not the only factor affecting decline of the silvery minnow. These operations change the natural flow regime of the river and thus may affect survival of the Rio Grande silvery minnow. The final rule recognizes these other factors in the "Summary of Factors Affecting the Species."

**Issue 4:** Reservoirs do not, as implied, store all spring runoff and summer inflows. Water is normally released during summer, not winter months. Diversion dams and canals have limited capacities to divert flows. They cannot "completely divert all flows . . . into irrigation ditches" under flood conditions.

**Response:** The Service agrees with the statement that reservoirs do not store all spring runoff and summer inflow. While most water is released during the spring and summer, a fall and winter release does occur in the Middle Rio Grande Valley when conditions permit (Beal and Gold 1988, Borland and Gold 1989). Under flood conditions, the irrigation diversions do not have the capacity to divert all flows. Under non-flood flows they do have the capacity to divert all flows. United States Geological Survey (USGS) records substantiate the occurrence of no-flow periods downstream of the various irrigation diversion dams.

**Issue 5:** The proposed regulation is unsupported by any hydrological study as to the statements that irrigation uses have depleted the water flow. Not a single source of information is cited for comments regarding hydrology of the river. Depletions of water in the system may be the result of the construction of wildlife watering impoundments by the Forest Service and Bureau of Land Management.

**Response:** It can be readily documented by examining USGS flow gage records that river flows decrease when the irrigation season starts. In addition, the Service reviewed Bullard and Wells (1992), which provides information on the hydrology of the middle Rio Grande. This reduction in flow is most noticeable in mid-summer after the spring to early summer peak flow has passed. Wildlife impoundments are often very small (less than one acre in size) and are considered to be insignificant in the amount of water they deplete from the drainage.

**Issue 6:** Economic considerations should be given more weight when communities may be affected.

**Response:** Section 4(a)(1) of the Act identifies five factors that are considered in making a determination of whether a species should be listed as threatened or endangered. Section 4(b)(1)(A) of the Act requires that listing determinations be based solely on the best available scientific and commercial data, and prohibits the Service from considering economic factors (50 CFR 424.11(b)). However, because

economics are considered in the designation of critical habitat, the Service will conduct an economic analysis in the process of evaluating proposed critical habitat for the Rio Grande silvery minnow.

**Issue 7:** The Service needs to ensure public input before listing the Rio Grande silvery minnow. The Service is required to notify counties and other affected parties to solicit their input prior to listing a species under the Act. The Service failed to meet this obligation.

**Response:** On February 19, 1991, about 80 pre-proposal letters of inquiry were mailed to various governmental agencies, knowledgeable individuals, and the New Mexico Congressional delegation. On March 20, 1992, the Service held a meeting in Albuquerque, New Mexico, with various interested governmental and private entities to explore existing or potential flexibility in water delivery schedules that might avoid dewatering of the Rio Grande within the range of the Rio Grande silvery minnow. The Service also published notices of the proposal in 5 local newspapers and mailed copies of the proposed rule to 148 different government agencies, private organizations, and interested individuals, including all counties having lands that border the area being proposed for critical habitat designation. Two public hearings were also held. The Service has fully met or surpassed the requirements of the Endangered Species Act for public notification.

**Issue 8:** The Service held public hearings only to fulfill a legal obligation and will not pay attention to any public comment. The Service should have held public hearings in El Paso and Las Cruces.

**Response:** The Service disagrees. All comments are carefully evaluated before the Service makes a determination on whether to proceed with a final rule. Numerous notifications of the proposed rule and extension of the comment period were distributed, and Service biologists traveled to several areas, including El Paso and Las Cruces, to present briefings on the proposed rule and accept comments.

**Issue 9:** The Service should establish a coordinating committee composed of interests below Elephant Butte Reservoir whose task would be to develop a full-scale report on the existing data available on the Rio Grande silvery minnow and how the river could be managed for the benefit of all, including the Rio Grande silvery minnow.

**Response:** After the species is listed the Service will consider, through the recovery planning process, establishing a coordinating committee to develop a report on the Rio Grande silvery minnow and how the river could be managed for the benefit of all, including the Rio Grande silvery minnow.

**Issue 10:** During periods of dewatering of the river, the ditches provide habitat for the species. The Service should consider exploring with the Middle Rio Grande Conservancy District, the counties, and other agencies the multiple use of riverside drains for the species and the preservation of bosque habitat.

**Response:** The Service agrees that during periods of drought, which result in the dewatering of the mainstream Rio Grande, the various irrigation ditches and drains may provide a temporary place of refuge for the Rio Grande silvery minnow. However, these areas do not contain suitable habitat for long-term use by the species. Few Rio Grande silvery minnows are found in the ditches and drains. Those that are found are believed to represent Rio Grande silvery minnows that became entrapped due to the diversion of irrigation water from the mainstream. The Service intends to investigate, with all interests, the potential use of the riverside drains for recovery of the species.

**Issue 11:** Few data exist on the abundance of the species on Pueblo lands or whether it can survive in the mud and sand when the river bed is dry.

**Response:** The Service used all available biological information in making the determination to list the Rio Grande silvery minnow as an endangered species. Recent census data from Pueblo lands are reported by Bestgen and Platania (1991), Platania and Bestgen (1988), Platania and Clemmer (1984), and the U.S. Bureau of Reclamation (1992). As additional information becomes available, including information from Pueblo waters, the Service will use that information in the recovery planning process. The Service hopes that, through initiation of recovery efforts for the species, and in cooperation with the Pueblos, additional information can be obtained on the status of the species on Pueblo lands. The Service has no scientific data indicating that the species survives in the mud and sand during periods when the river is dry.

**Issue 12:** Competition between *H. amarus* and its congener *H. placitus* could have also contributed to extirpation of the species from the Pecos River. Studies should be conducted to determine if predation or competition by non-native fishes impacts the species. The studies should not just determine if it is a problem, they should also determine where and to what extent it is a problem.

**Response:** The Service has no data to substantiate any reasons for extirpation of the Rio Grande silvery minnow from the Pecos River and replacement by its congener *H. placitus*. Competition may have been a factor in its extirpation; however, it is more likely that hybridization between the two species was the primary factor. Studies designed to determine if predation or competition by non-native fishes impacts the survival of the Rio Grande silvery minnow will be conducted as part of recovery efforts for the species.

**Issue 13:** Recent biological studies have been conducted during a period of high flow; therefore, the results of those studies do not accurately reflect the distribution of the species under normal conditions.

**Response:** It is true that, other than 1989, recent data have been collected during a period of higher than normal flow. However, even these data show that the species is not as abundant as it was during other periods of above-normal flow. This leads to a conclusion that factors other than flow may be impacting the species and its habitat.

**Issue 14:** It seems a fair conclusion that the Cochiti downstream reach is no longer favorable habitat because of lowered water temperatures and degradation of favored *H. amarus* substrate. This further limits the area in which the species has to survive.

**Response:** Although the reach immediately downstream of Cochiti Dam may not be favorable habitat for the Rio Grande silvery minnow, it is not known how far downstream these conditions persist. As part of recovery efforts for the species, studies will be conducted on this question, and attempts may be made to correct the unfavorable conditions.

**Issue 15:** Since little is known of feeding habits or reproduction, the claim that channel modification would adversely affect the Rio Grande silvery minnow is not supported by the best scientific evidence. Changes in food supply, not water supply, may be a factor affecting the species in the Rio Grande. Also, the effects of non-native plants upon the habitat need to be investigated.

**Response:** Recent data have shown that spawning activity occurs during peak spring and early-summer flows. The fertilized eggs drift with the current for about 24 hours and then hatch. The larval fish continue to drift downstream until they are swept into calm backwater and edge areas where food is abundant and they can continue to grow. Because of this spawning behavior, any modifications to the channel that result in changes that sweep the eggs and larval fish into less favorable habitats would

adversely affect the species. There are no data presently available to support the contention that a reason for decline of the species was a decrease in the species' food supply or the invasion of non-native plants. As part of recovery efforts, the impacts of all habitat modifications will be investigated to determine if and how they impact the species.

**Issue 16:** Very little information was presented at the public hearing or in the *Federal Register* to show a cause-and-effect relationship between water quality and decline of the species.

**Response:** Limited information exists on the relationship between water quality and the decline of the species. A better understanding of this relationship will be developed as a result of recovery efforts.

**Issue 17:** The proposed listing of the Rio Grande silvery minnow is just a part of a much larger problem-the modification of the floodplain. Are activities at Bosque del Apache National Wildlife Refuge (NWR) affecting the species?

**Response:** The Service agrees. Listing the species will invoke protective provisions of the Act, such as those contained in section 7. The Service has no information that indicates activities at Bosque del Apache NWR impact the species. The Service will work with Federal agencies, including Bosque del Apache NWR, to ensure that their actions do not jeopardize the species through adverse effects on the floodplain. In addition, the Service is involved in several cooperative efforts with Federal, State, and private entities to protect the Rio Grande Bosque and associated floodplain.

**Issue 18:** The facts presented in the status report do not support the conclusion that "anticipated additional modifications" would limit prospects of survival for the species in the middle Rio Grande.

**Response:** The facts presented in the status report do support the conclusion that "anticipated additional modifications" would limit prospects of survival for the species in the middle Rio Grande. According to the authors of the status report, "Conservation measures are necessary as continued habitat and flow modifications, introductions of non-native species, and lack of refugia threaten survival of *H. amarus*." The present status of the species is such that any activity that could negatively impact the species may limit prospects for its survival.

**Issue 19:** Only two facts support listing; that the species is presently found in only 5 percent of its historic range, and that other fish native to the middle Rio Grande (Rio Grande bluntnose shiner, phantom shiner, Rio Grande shiner, and speckled chub) have been extirpated from the river. The Service does not have adequate data to support the conclusion that the Rio Grande silvery minnow is endangered and should be listed under the Act.

**Response:** The Service agrees that the above two facts support listing. However, other facts that support listing include the species' decrease in abundance within the area it presently occupies, and its extirpation from the Pecos River after the introduction of the plains minnow into that system. The Service concludes, as detailed in the "Summary of Factors" section, that there is sufficient evidence to support listing the species as endangered under the Act. The Service reviewed the best scientific and commercial data available to make this determination.

**Issue 20:** The Rio Grande silvery minnow is not a distinct species. It is just a local population of the Mississippi silvery minnow. The Service should consider conducting studies for two years on the species' taxonomy.

**Response:** The Service has taxonomic information that verifies the Rio Grande silvery minnow as a distinct species. The Rio Grande silvery minnow is recognized by the American Fisheries Society, which is considered the scientific authority for the names of fishes, as a full species (American Fisheries Society 1991). Cook *et al.* (1992), using starch gel electrophoretic methods, found that phenetic and phylogenetic analyses corroborated the hypothesis that *H. amarus* is distinct at the species level from *H. nuchalis* and *H. placitus*, with which it was previously grouped.

**Issue 21:** The Service has not conducted in-depth studies to determine the number of silvery minnows that exist in the Middle Rio Grande Valley and associated drainage ditches. The species may be doing well without protection of the Federal government.

**Response:** Since 1987, studies have been conducted to document the population of Rio Grande silvery minnows in both the Middle Rio Grande Valley and its associated irrigation and drainage ditches from Velarde to Elephant Butte Reservoir, New Mexico. These studies have shown that very few Rio Grande silvery minnows survive in the drainage ditches. The listing is based, in part, upon the extirpation of the species from about 95 percent of its historic range. The species was once thought to be one of the most numerous fish in the Rio Grande. In 50 fish collections made between Bernalillo and Elephant Butte Reservoir between 1987 and 1988, the Rio Grande silvery minnow was the second most abundant species, comprising 18 percent of the total fish collected. From 1989 to 1992, 56 collections were made in the same area and only 3 Rio Grande silvery minnows were collected. During that period, the Rio Grande silvery minnow went from being the second most abundant native fish species to the least abundant native species (Platania 1993). The Service believes that without the protection afforded through Federal listing, the species is likely to become extinct. Two native Rio Grande fish species have already become extinct.

**Issue 22:** The fish exist in stretches of the river that have been subject to drying for at least 50 years, but have disappeared from areas where there has been instream flow for the past 50 years.

**Response:** The Service agrees that the species has persisted in reaches